

## AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for improved ultrasound imaging, said method comprising:

encoding an ultrasound signal with a code to produce an encoded ultrasound vector;

transmitting from a first location said encoded ultrasound vector at a desired angle;

receiving at a second location an encoded echo signal produced in response to said encoded ultrasound vector without receive beamforming said encoded echo signal; ~~and~~

decoding said encoded echo signal using said code used to produce said encoded ultrasound vector; and

determining a position of a structure producing said encoded echo signal in response to an impact by said encoded ultrasound vector based on a time of transmission of said encoded ultrasound vector, a time of reception of said encoded echo signal, and a strength of said encoded echo signal, said time of transmission being determined based on said code;

wherein said first location comprises a transducer array for transmitting said plurality of ultrasound signals and said second location comprises a single element transducer, separate from and independent of said transmitting transducer array, dedicated to receiving said echo signals.

2. (Cancelled) ~~The method of claim 1, further comprising determining a position of a structure producing said encoded echo signal in response to an impact by said encoded ultrasound vector.~~

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3. (Cancelled) ~~The method of claim 2, wherein said determining step further comprises determining said position based on a time of transmission of said encoded ultrasound vector, a time of reception of said encoded echo signal, and a strength of said encoded echo signal.~~

4. (Currently Amended) The method of claim ~~3~~ 1, wherein said determining step further comprises determining said position based on an angle of transmission of said encoded ultrasound vector.

5. (Cancelled) ~~The method of claim 3, wherein said time of transmission is determined based on said code.~~

6. (Original) The method of claim 1, further comprising:  
transmitting from said first location a plurality of encoded ultrasound vectors at a plurality of angles;  
receiving at said second location a plurality of encoded echo signals produced in response to said plurality of encoded ultrasound vectors; and  
obtaining an image of an object based on said encoded ultrasound vectors and said encoded echo signals.

7. (Currently Amended) A method for obtaining ultrasound images at an improved acquisition rate, said method comprising:  
encoding a plurality of ultrasound signals for a frame with distinct codes;

sequentially transmitting from a first location said plurality of ultrasound signals at a plurality of angles;

receiving at a second location distinct from said first location a plurality of echo signals formed based said plurality of ultrasound signals without receive beamforming said plurality of echo signals; and

decoding said plurality of echo signals using said plurality of distinct codes,

wherein said first location comprises a transducer array for transmitting said plurality of ultrasound signals and said second location comprises a single element transducer, separate from and independent of said transmitting transducer array, dedicated to receiving said echo signals, further wherein each echo signal is decoded using a code used to encode an ultrasound signal producing said echo signal.

8. (Cancelled) ~~The method of claim 7, wherein each echo signal is decoded using a code used to encode an ultrasound signal producing said echo signal.~~

9. (Original) The method of claim 7, wherein said decoding step further comprises decoding said plurality of echo signals offline concurrently with said transmitting step and said receiving step.

10. (Currently Amended) An improved ultrasound imaging system, said system comprising:

an encoder for encoding an ultrasound signal with a code for transmission to form an encoded ultrasound signal;

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a transmitter for transmitting said encoded ultrasound signal; and  
a receiver for receiving an encoded echo signal produced based on said encoded ultrasound signal, wherein said receiver decodes said encoded echo signal to produce a decoded echo signal, and wherein said receiver does not receive beamform said encoded echo signal; and  
a processor for determining a position of a scatterer producing said encoded echo signal in response to an impact by said encoded ultrasound signal;

wherein said receiver comprises a single element transducer separate from and independent of said transmitter, said processor determines said position of said scatterer based on a time of transmission of said encoded ultrasound signal, a time of reception of said encoded echo signal, and a strength of said encoded echo signal, said time of transmission being determined based on said code used to encode said encoded ultrasound signal.

11. (Original) The system of claim 10, wherein said transmitter comprises a transducer array for transmitting said encoded ultrasound signal.

12. (Canceled).

13. (Original) The system of claim 10, wherein said encoder encodes a plurality of ultrasound signals for transmission with a plurality of codes.

14. (Original) The system of claim 13, wherein said codes comprise distinct codes for each ultrasound signal within a frame.

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15. (Original) The system of claim 10, wherein said transmitter sequentially transmits a plurality of encoded ultrasound signals.

16. (Original) The system of claim 15, wherein said transmitter sequentially transmits said plurality of encoded ultrasound signals at a plurality of angles.

17. (Cancelled) ~~The system of claim 10, further comprising a processor for determining a position of a scatterer producing said encoded echo signal in response to an impact by said encoded ultrasound signal.~~

18. (Cancelled) ~~The system of claim 17, wherein said processor determines said position of said scatterer based on a time of transmission of said encoded ultrasound signal, a time of reception of said encoded echo signal, and a strength of said encoded echo signal.~~

19. (Cancelled) ~~The system of claim 18, wherein said time of transmission is determined based on said code used to encode said encoded ultrasound signal.~~

20. (Currently Amended) The system of claim ~~17~~ 10, wherein said processor further determines said position of said scatterer using an angle of transmission of said encoded ultrasound signal.

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21. (Original) (Currently Amended) The system of claim ~~47~~ 10, wherein said processor determines said position as additional encoded ultrasound signals are transmitted by said transmitter and additional encoded echo signals are received by said receiver.

22. (Canceled).